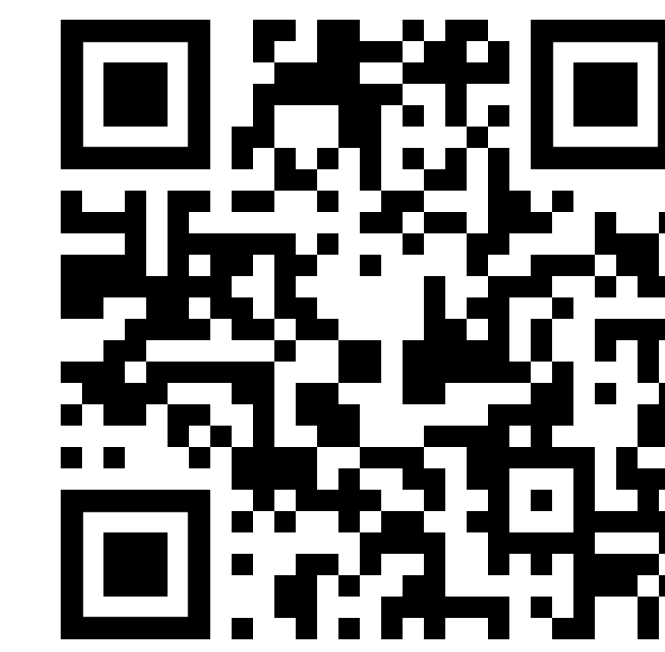


Identifying the path to success: Case Study: COE BESST Learning Community

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Scan the QR code on your mobile device to access more information on the Data Fellow's program.

1. Open your camera app on your mobile device.
2. Hold your device over the QR code so that it is clearly visible.
3. Open the website when it pops up on your screen.

Research Questions

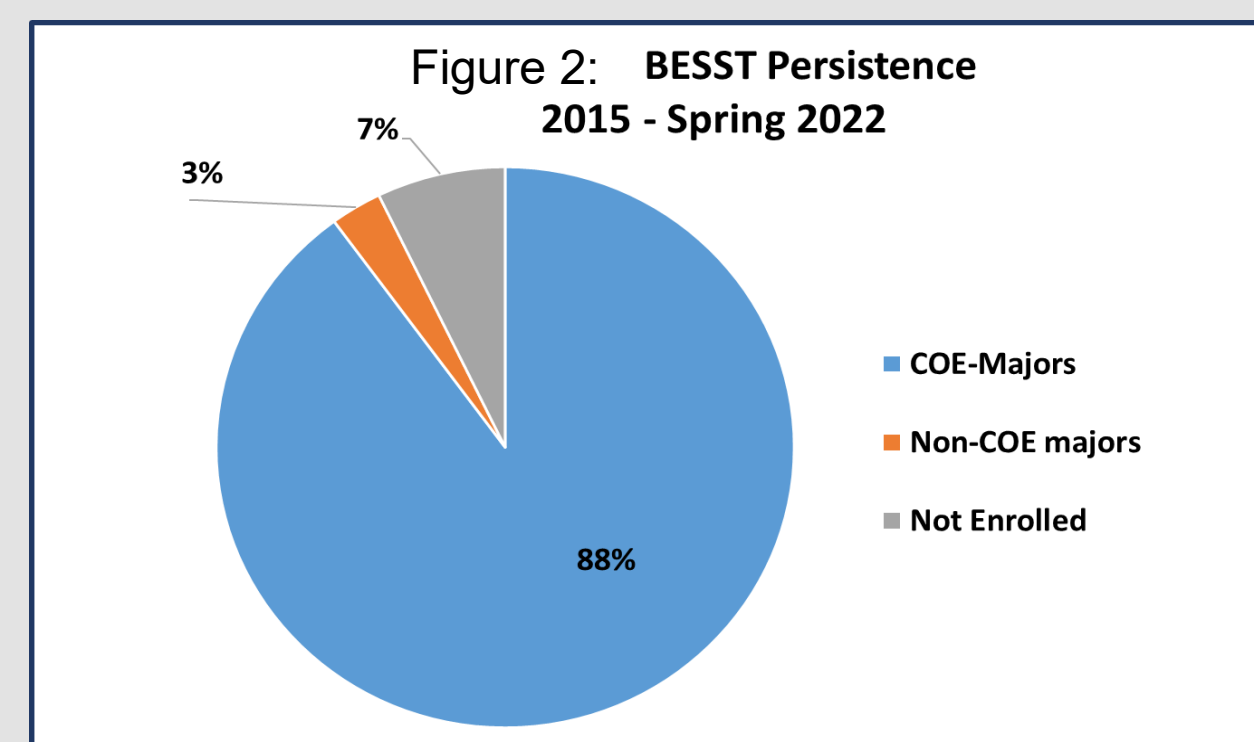
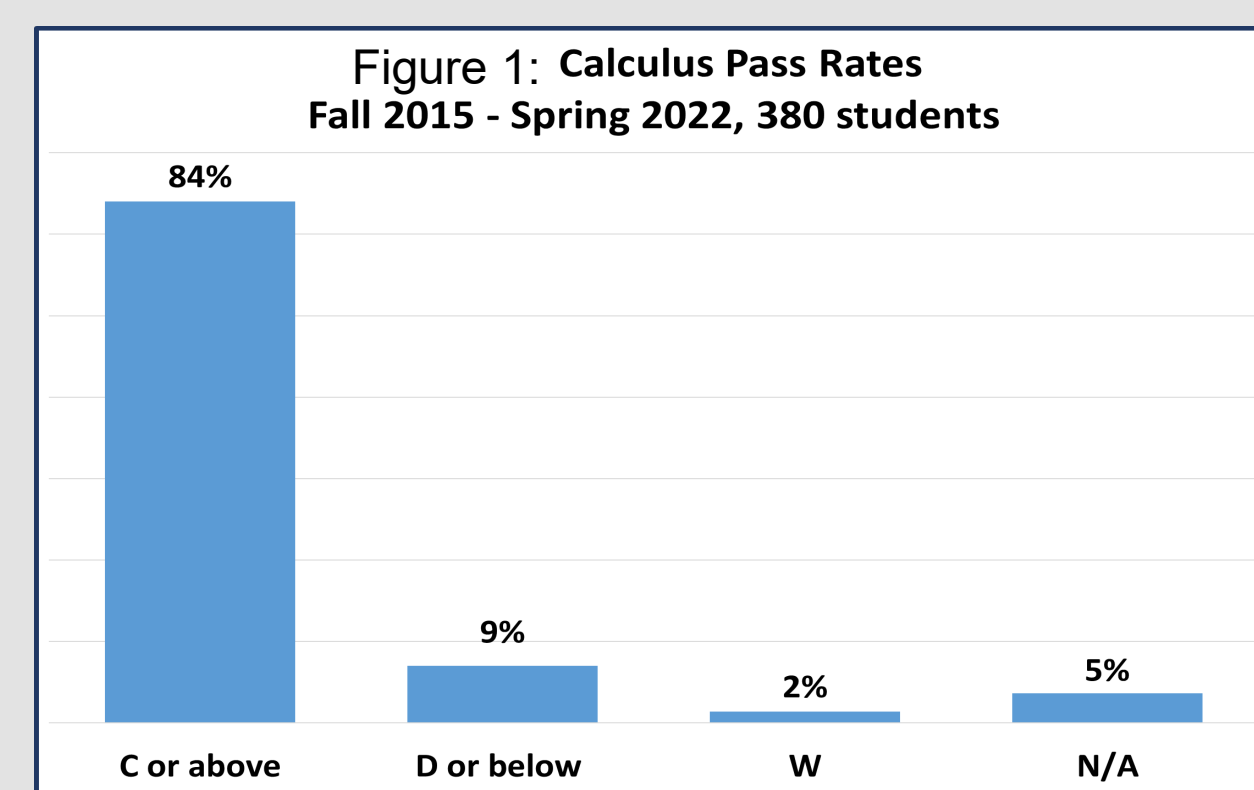
The first CSULB College of Engineering BESST learning community was established in 2015. The university plans to expand learning communities in the upcoming 2023-2024 academic year. This prompted us to investigating the success of students who participated in BESST in order to better understand:

- The pattern of classes BESST students enrolled throughout their academic career
- The success of the BESST students in those classes
- The relationship of class enrollment patterns with graduation rates

Introduction

The COE Beach Engineering Student Success Team (BESST) program supports incoming freshmen engineering students who are 'at risk' of leaving Engineering based on their Math placement exam (ALEKS-PPL score). The students are recruited in the summer and participate in a two-week summer program focusing on both academic content and learning strategies. In the fall, the BESST students are split into two cohorts of up to 30 students for a two-semester learning community. Classes and additional support services, such as tutoring, academic advising, and academic and professional development workshops, are offered in the same classroom.

Given the success of the program, starting in Fall 2023, COE will increase the number of cohorts to 6 and expand the number of courses students will be taking together. In addition to the MATH courses, student cohorts will be registered in a General Education course, and in an introductory engineering course. Two of the six cohorts will be major specific, with students also registered in one or more lower-division courses in their major.



From SEF HVDI-GI2025 2022-2023 report

Over the past nine years, the BESST program has seen 320 students, 84% of the total students in the program, pass Calculus I during their first year (FIG. 1). FIG. 2 shows the overall BESST persistence rates for the 2015-22 period. 88% of the total number of students who participated in the BESST program from 2015 to 2022 is enrolled in a COE major.

Methods

Students in the 2016 BESST learning community were admitted to majors from across the college of engineering. Approximately 1/4 of the student were in the BS Computer Science program. For this project we utilized quantitative data for BESST and BS Computer Science students from Tableau, and BeachConnect, as well as curricular information.

The Student Enrollment Dynamic Model, which started as a Data Fellows project in 2018 and has been built on in the intervening years, is being utilized to dig into the enrollment data. We started by fitting the dynamic model using graduation, persistence and retention from data from the BS Computer Science Fall 2016 FTF data from Tableau. Because similar data is not available in Tableau for the BESST Fall 2016 FTF cohort, the values were obtained from BeachConnect advising data.

Results

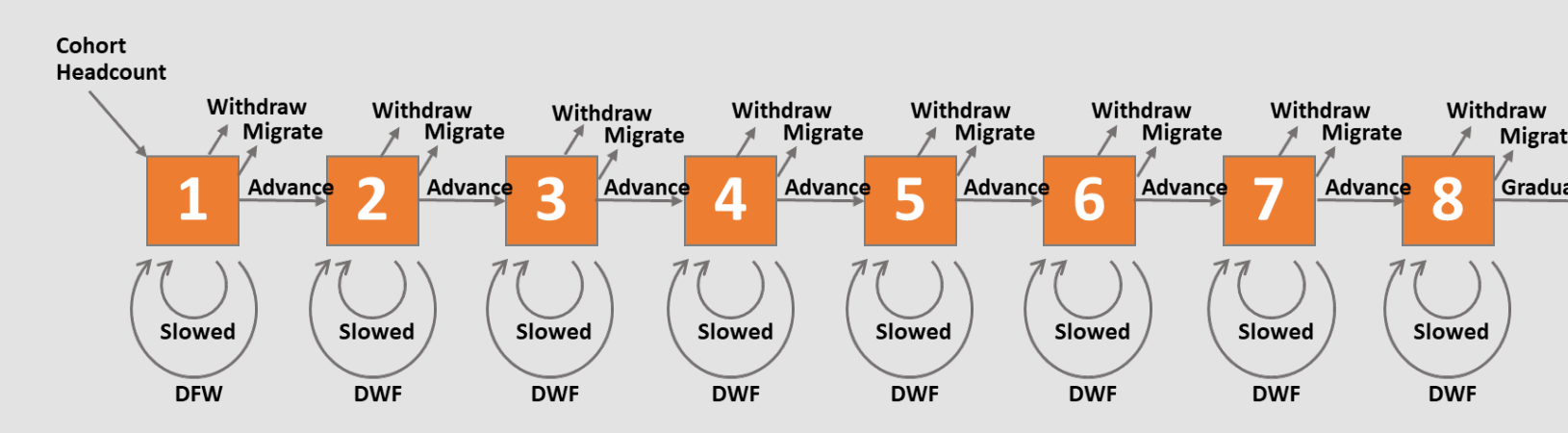
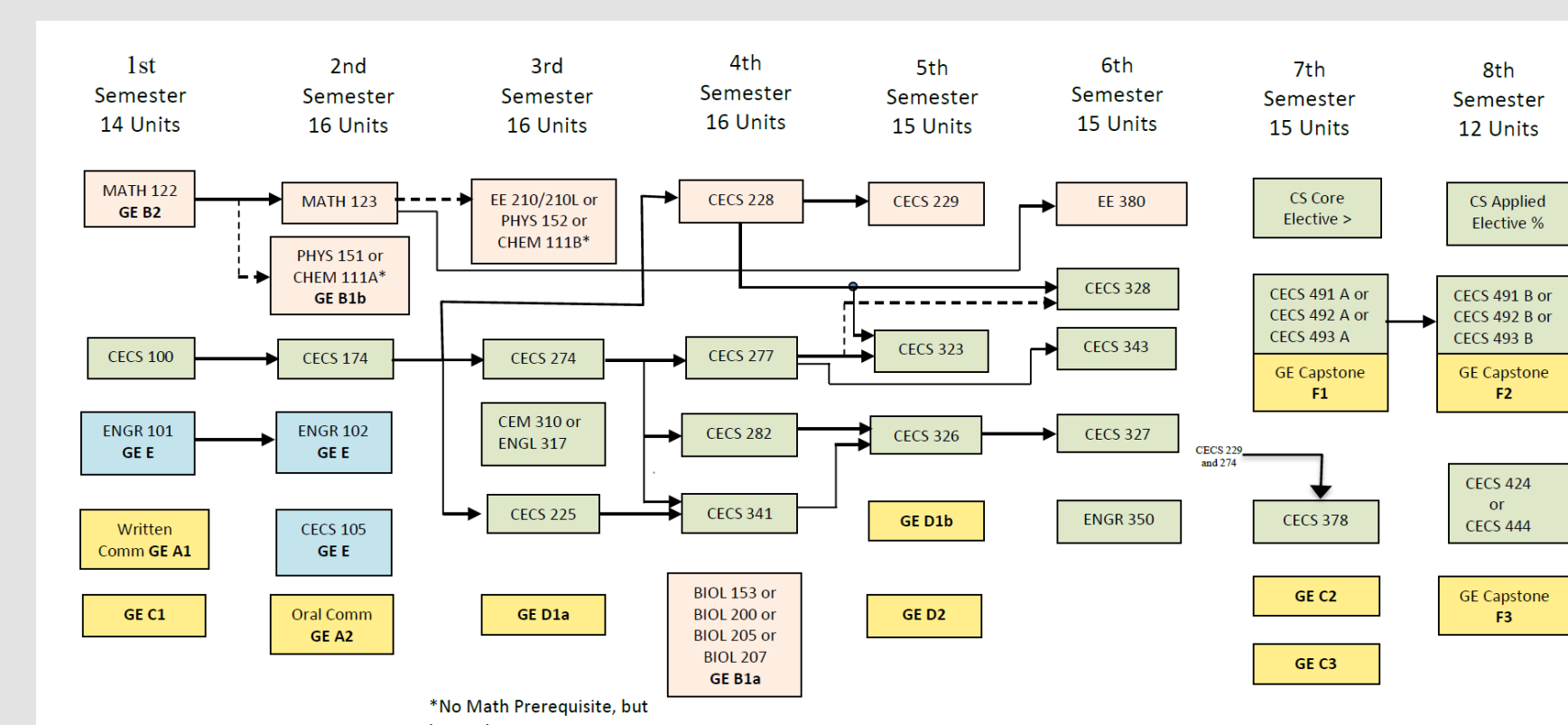


Figure 3: Left: 2016-17 BS Computer Science Curriculum Flow Chart. Above: Structure of the Student Enrollment Dynamic Model

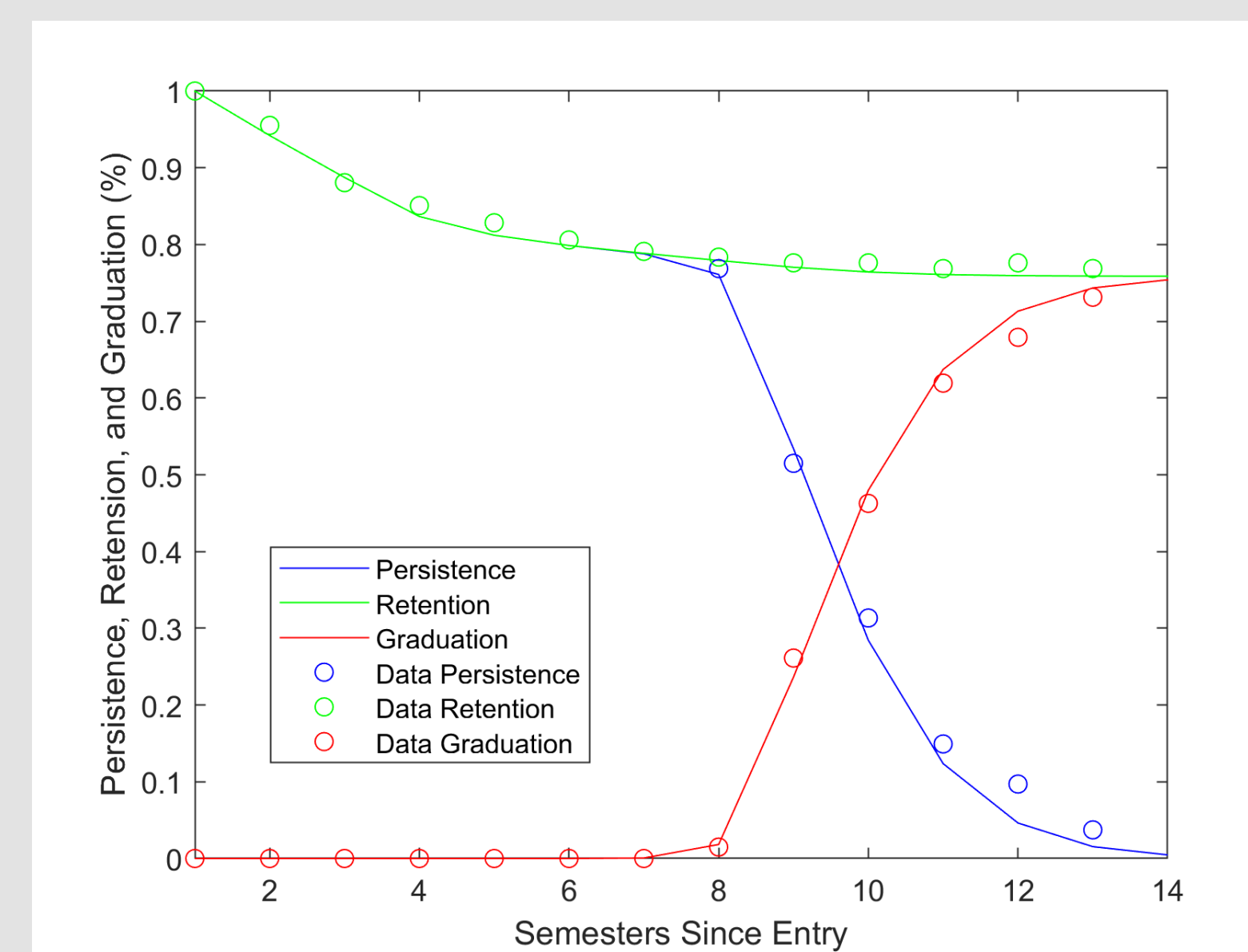


Figure 4: Fall 2016 BS Computer Science FTF Cohort. Open circles – Tableau data, Solid line – Dynamic Model Fit

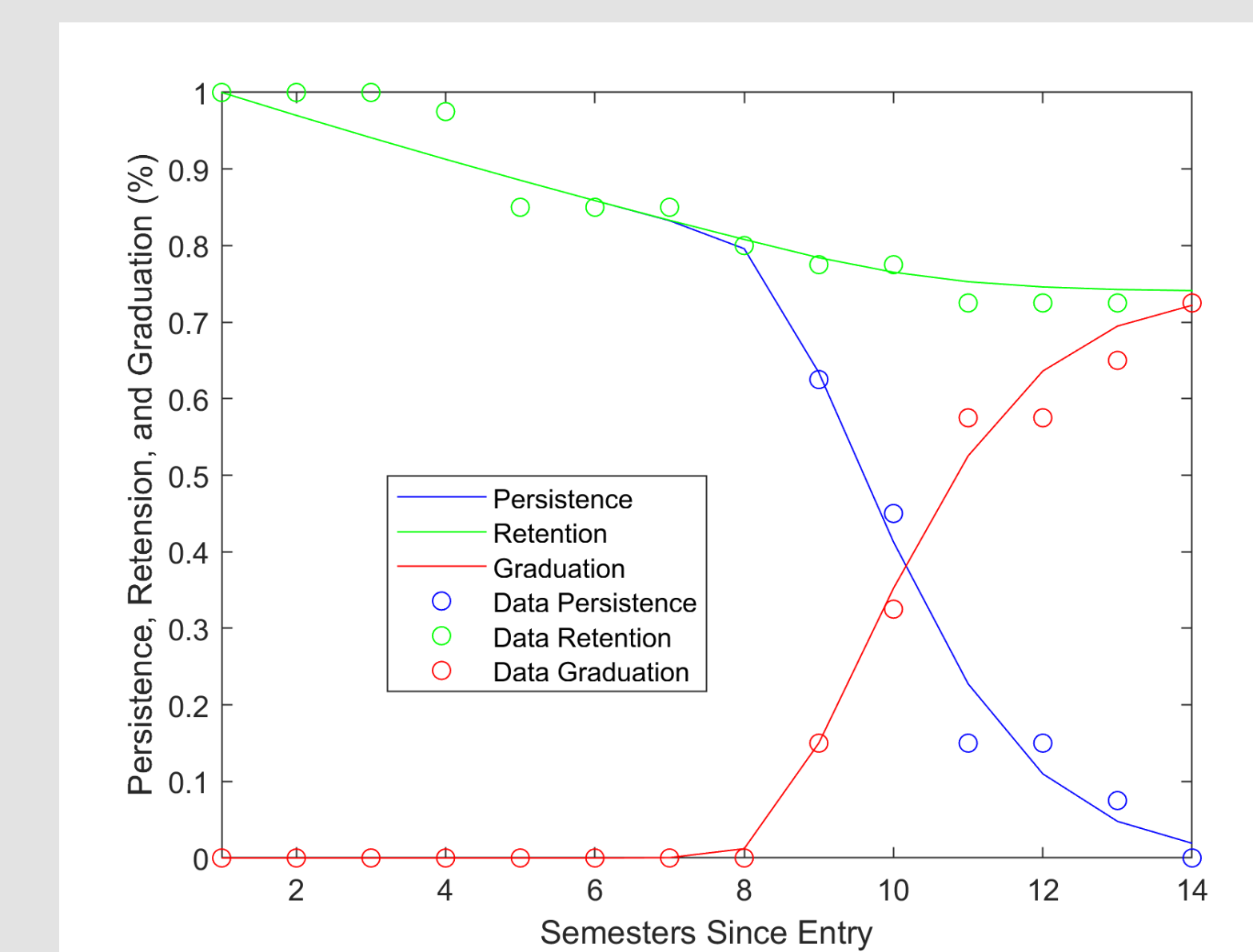


Figure 5: Fall 2016 BESST FTF Cohort. Open circles – Derived from BeachConnect data, Solid line – Dynamic Model Fit

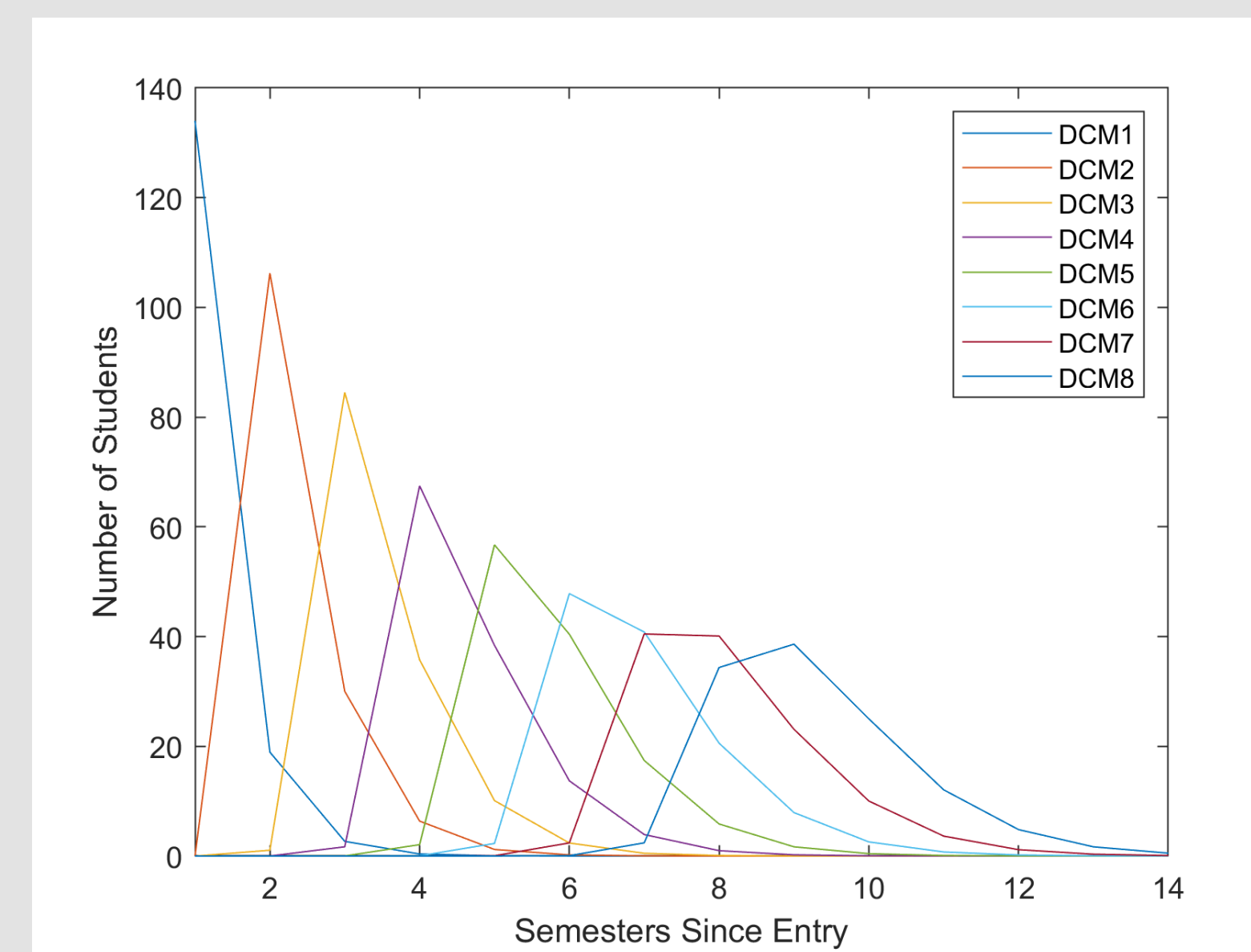


Figure 6: Degree Completion Milestones (DCMs) for Dynamic Model fit to Fall 2016 BS Computer Science FTF Cohort

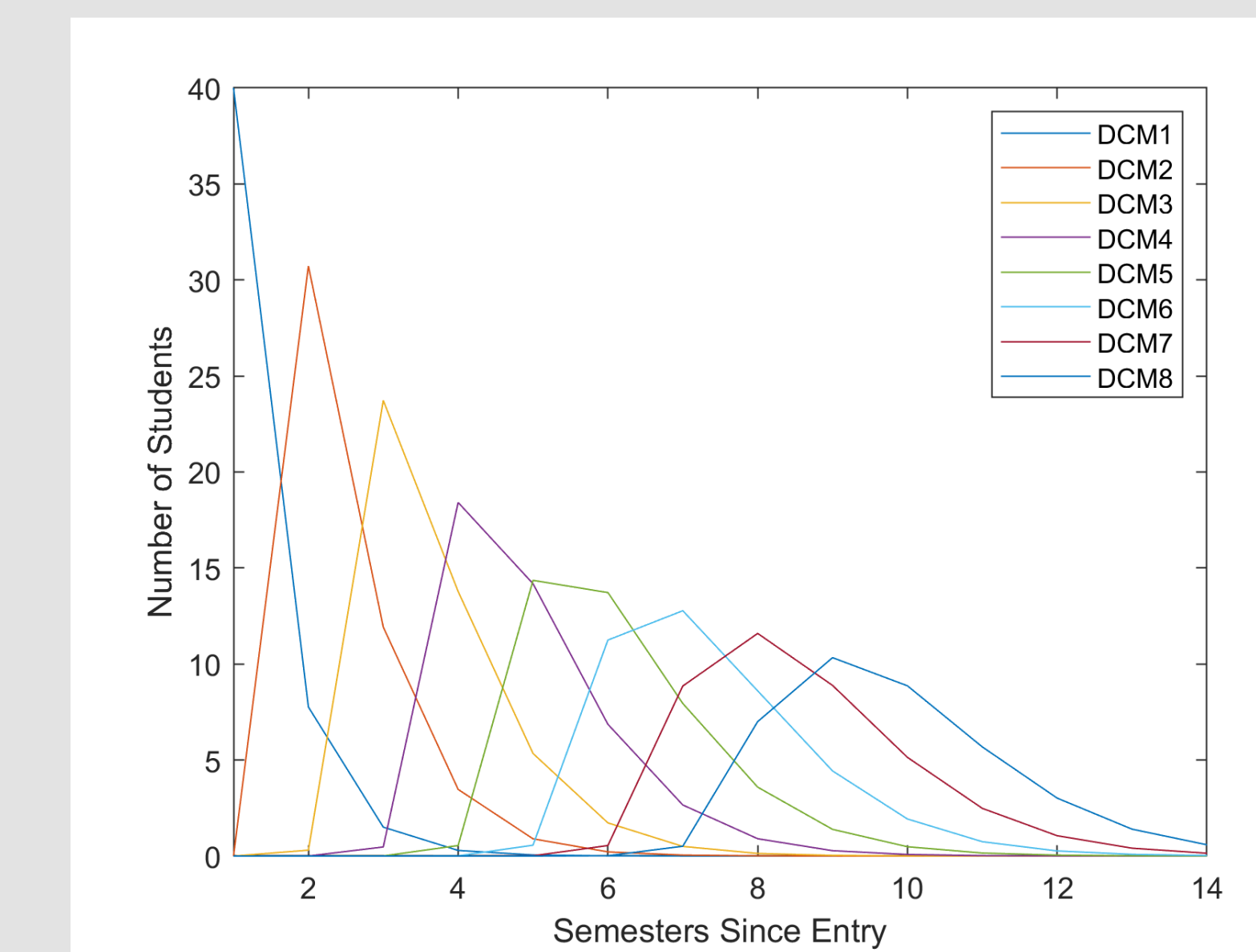


Figure 7: Degree Completion Milestones (DCMs) for Dynamic Model fit to Fall 2016 BESST FTF Cohort

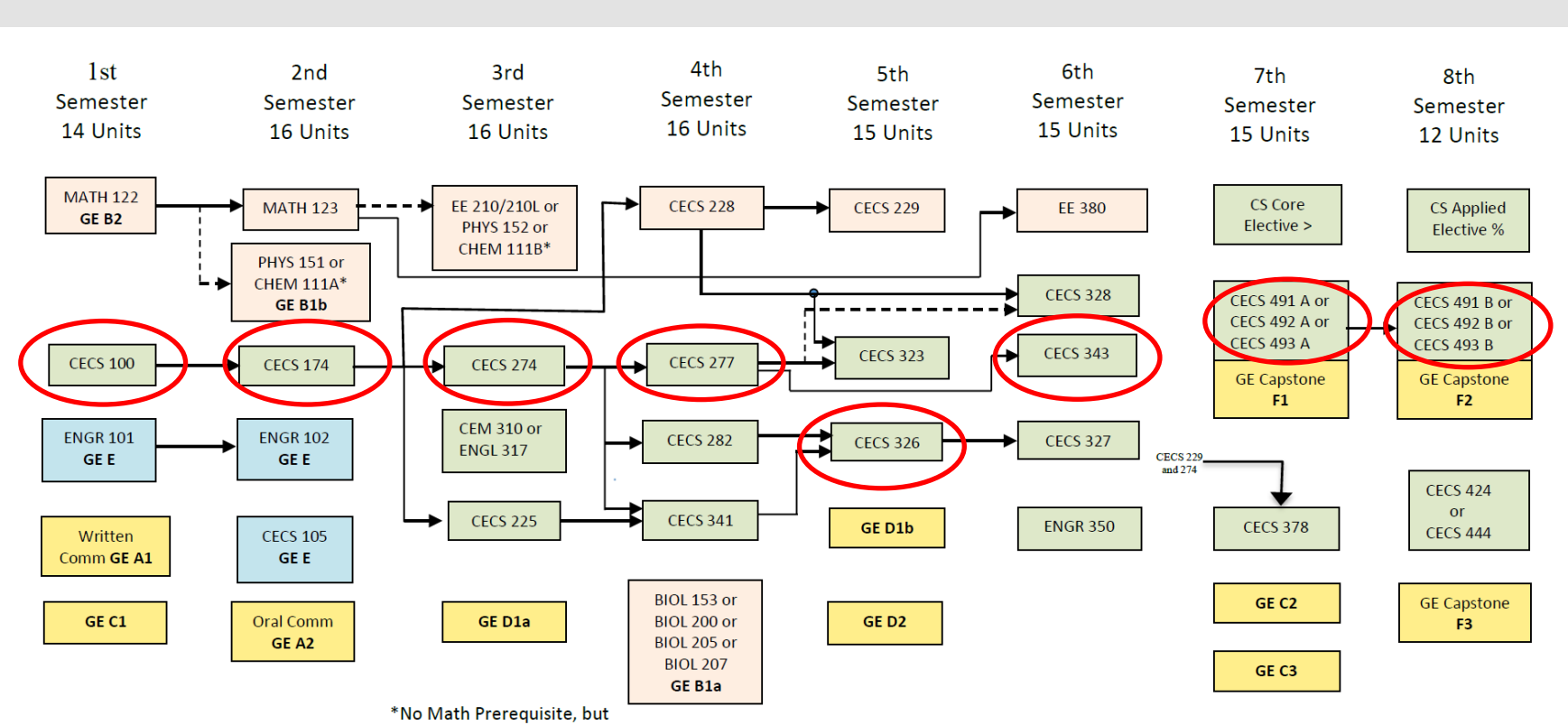
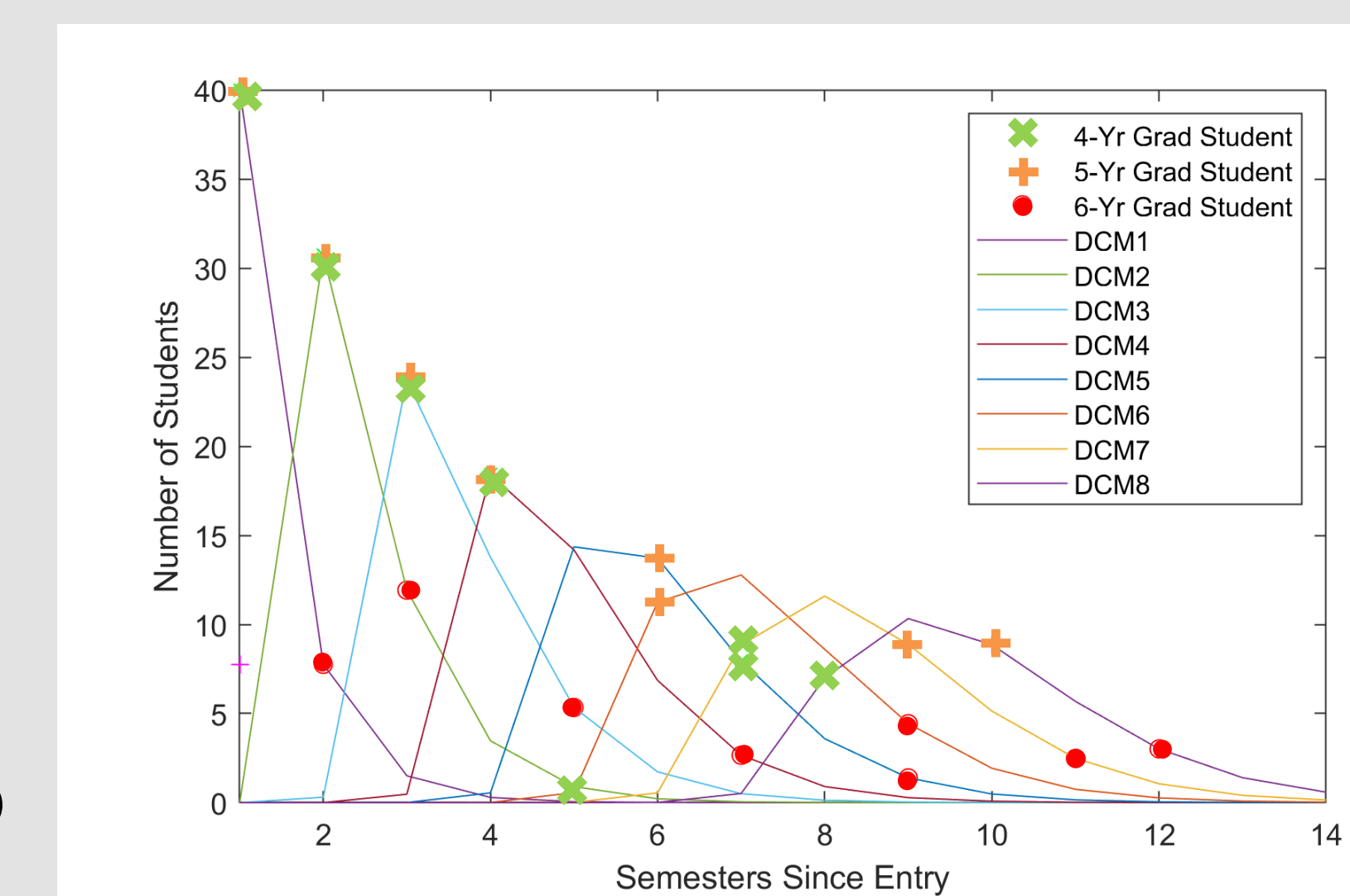


Figure 8a: A class from each semester of the BSCE curriculum flow chart was selected to estimate progress on the Degree Completion Milestones (DCMs) Figure 8b: Three representative students from BESST Fall 2016 FTF Cohort who graduated in 4 years (green x), 5 years (orange +) and 6 years (red circle) were selected. The class completion time for each student is plotted on the Degree Completion Milestone(DCM) curves



Conclusion / Discussion

Figure 4 shows the graduation, persistence and retention data for the Fall 2016 BS Computer Science FTF Cohort within the university. The dynamic model is fitted using fitting parameters to account for students who withdraw from the university and the speed or slowness that students proceed through their curricular units. Figure 5 shows similar data and fitted model for the Fall 2016 BESST FTF Cohort.

A comparison of the results reveals that:

- The BSCE students drop from the university at a much higher rate in the first 4 semesters compared to the BESST cohort.
- In the longer term, the graduation rate from the BESST cohort slightly lags the BSCE cohort, indicating that the BESST students may be taking fewer units or receiving DWFs at slightly higher rates.
- The long term (6+ year) graduation rates for the two groups are similar (~72-75%).

Figure 6 shows the modeled DCMs for the Fall 2016 BS Computer Science FTF Cohort. Figure 7 shows similar modeling results for the Fall 2016 BESST FTF Cohort. Comparing the DCMs for the two cohorts we notice that:

- Because some of the BESST students may be progressing more slowly, the BESST cohort is spread across a larger range of class levels, and they are more likely to complete all classes on or after semester 12.

Figure 8a shows the curriculum flow chart for the BSCS program. One class was selected for each semester as a representative of each DCM. Figure 8b shows the class completion times for three representative BESST BSCS students.

- The data from the student who graduated in 4 years plots on the left up-slope of each DCM curve, indicating that the student consistently took the classes at an early time-frame compared to the general population.
- The completion data from student who graduated in 6 years consistently plots on the right down-slope of each DCM, indicating that the student consistently took class after most of the cohort peers.
- The student who graduated in 5 years starts out slightly behind, catches up and then lags behind the cohort peers.

Implications for Action

This preliminary analysis of data collected from the 2016 BESST cohort, showed that the withdrawing rate from the university in the first 4 semesters is much higher for students who did not participate in the program compared to the BESST cohort. Although the results pertain to a limited number of students, they show that the BESST program is successful in retaining students for the first two years.

However, we noticed that the withdrawal rate of the BESST students increased starting in semester 5, which may indicate a need to develop a supporting plan to ease the students' transition from the 'cohort' to more general class enrollment.

Next Steps / Future Directions

We will expand this study to quantify the impact of the BESST program on the achievement gap, the retention and the graduation rates.

Our plan includes the following steps:

- Collect data from all BESST cohorts from AY 2016-17 to AY 2022-23.
- Apply the model to BESST students in each engineering program and compare to those of students outside the programs.
- Determine the relationship between enrollment and completion time of major milestone courses in the program and graduation rates.
- Identify the courses that cause delays in graduation for most students and potential causes
- Develop appropriate intervention strategies